

Claims:

1. A gear shifting cassette unit (11) for shifting of gears in a change gear transmission (1), the transmission comprising at least two shift rails (7, 8)

the cassette unit (11) including:

a cassette housing (25) comprising bearing means () for movably supporting at least one shift element (53) for engaging and moving the shift rails (7, 9) and a coupling (49) for connecting the shift element (53) to a shift finger (51).

2. The gear shifting cassette unit according to claim 1 comprising mounting means (26) for fixedly securing the housing (25) on a transmission housing (4) in a position where the shift element (53) can be moved to selectively engage.

3. The gear shifting cassette unit according to claim 2, wherein the housing (25) of the cassette (11) comprises, as the mounting means (26), a flange (26) which is to be clamped between a surface surrounding an opening (22) of the transmission housing (4) and a housing (5a) of an actuation unit for moving the shift finger (51) in an (X-X) direction and an (Y-Y) direction.

4. The gear shifting cassette unit according to claim 1 wherein the shift element (53) protrudes through an opening (50) provided in the cassette housing (25) for engaging the shift rails (7, 8).

5. The gear shifting cassette unit according to claim 1 wherein the coupling (49) for connecting the carrier member (47) to the shift finger (51) in the (X-X) direction and the (Y-Y) direction is provided on a carrier member (47).

6. The gear shifting cassette unit according to claim 1 wherein the bearing means comprises a traversing member (31) located in the cassette housing (25) movable in the (X-X)

direction and supporting the carrier member (47) movable in the (Y-Y) direction.

7. The gear shifting cassette unit according to claim 6 wherein the traversing member (31) comprises two opposite guiding surfaces (44, 45) which are in sliding engagement with inner surfaces (34, 35) of the casing facing each other.

8. The gear shifting cassette unit according to claim 7, wherein the traversing member (31) comprises an oblong opening (46) with the carrier member (47) located therein and movable in the (Y-Y) direction.

9. The gear shifting cassette unit according to claim , wherein a biasing device (70) is associated with the traversing member (31).

10. The gear shifting cassette unit according to claim 9, wherein the biasing device (70) comprises at least one spring means urging the traversing member into a desired position.

11. The gear shifting cassette unit according to claim 10, wherein the spring means is a compression spring.

12. The gear shifting cassette unit according to claim 11, wherein the traversing member (31) comprises a shaft (54) extending in X-X direction and carrying the compression spring.

13. The gear shifting cassette unit according to claim 12, wherein the compression spring is clamped between two pressure disks (62, 63) located on the shaft between respective stop means (64, 65).

14. The gear shifting cassette unit according to claim 13, wherein the casing (5a) of the cassette (11) comprises two abutment means (62, 63) for the spring means limiting the travel of the spring means (61) in opposite directions.

15. The gear shifting cassette unit according to claim 1, wherein a travel path limiting element is associated with the traversing member (31).

16. The gear shifting cassette unit according to claims 12 and 15, wherein the travel path limiting element (66) is a sleeve (66) located on the shaft (54).

17. The gear shifting cassette unit according to claim 7, wherein the traversing member (31) comprises a blocking member (36) for enabling the shift rail selected by the carrier member (47) to move in the Y-Y direction and for blocking all other shift rails (7, 8, 9, 10) in their neutral position.

18. The gear shifting cassette unit according to claim 17, wherein the blocking member (36) extends in X-X direction and engages the shift rails (7, 8, 9, 10) for blocking them in Y-Y direction, and wherein the blocking member comprises at least one cutout for unblocking the shift rail (7, 8, 9, 10) that is in registration with the cutout.

19. The gear shifting cassette unit according to claim 17, wherein the casing comprises a slit-like opening (37) and the blocking member (36) is extending therethrough.

20. The gear shifting cassette unit according to claim 17, wherein the blocking member (36) is a one piece unit with the traversing member.

21. The gear shifting cassette unit according to claim 1, wherein two shift elements (52, 53) having the shape of tongues (52, 53) are provided which extend into shift rail connecting members (42, 43) and being spaced apart in the X-X direction.

22. The gear shifting cassette unit according to claim 21, wherein a distance is provided between the tongues (52, 53), which distance is greater than the width of the connecting

member in the X-X direction.

23. gear shifting cassette unit assembly according to claim 21, wherein the transmission comprises at least three shift rails (7, 8, 9, 10), two of them arranged in close distance so that, if one tongue (52, 53) is in regular registration with the connecting element (42, 43) of the selected shift rail (7, 8, 9, 10), the other connecting element (42, 43) remains within the void between the tongues (52, 53).

24. The gear shifting cassette unit according to claim 23, wherein two of the shift rails (7, 8, 9, 10) are arranged in far distance so that, if one tongue is in regular registration with the connecting element of a selected shift rail, the other tongue is not in registration with the connecting element (42, 43) of the other shift rail (7, 8, 9, 10).

25. The gear shifting cassette unit according to claim 1, wherein the housing (25) of the cassette (11) has an outer shape that fits into an opening (22) of the transmission.

26. A gear shifting mechanism (24) comprising at least two shift rails (8, 9) having a neutral position and being axially movable in an axial (Y-Y) direction out of the neutral position for engaging a gear, each shift rail (8, 9) having a shift rail connecting member (42, 43), and a cassette unit according to one of claims 1 to 25.

27. Transmission having a gear shifting assembly including a gear shifting cassette unit according to at least one of claims 1 to 25 and a gear shifting mechanism (24) for shifting of gears in the transmission (1) comprising a transmission housing (4),

said shifting mechanism (24) comprising an actuation unit (5) having a actuation unit housing (5a) to be mounted on the transmission housing (4), said actuation unit comprising a shift finger (51) movable in the first axial (Y-Y) direction

for axially moving a selected one of the shift rails (7, 8, 9,
30 10) and in the second (X-X) direction for selecting a shift
rail,

the gear shifting assembly including:

a cassette housing (25) having mounting means (26) for
fixedly securing the housing (25) on the transmission housing
35 (4) in a position where the shift elements (52, 53) can be
moved to selectively engage the connecting members (42, 43) of
the shift rails (7, 8, 9, 10),

a traversing member (31) located on the cassette housing
(4) and movable in the (X-X) direction,

40 the carrier member (47) being supported by the traversing
member (31) and movable in the (Y-Y) direction and being
provided with the shift elements (52, 53) at one side thereof
protruding through an opening (22) provided in the cassette
housing and engaging with a shift rail connecting member (42,
45 43), the carrier member (47) being provided with a coupling
(49) for connecting the carrier member (47) to the shift finger
(51) in the (X-X) direction and the (Y-Y) direction.